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2024_28_III_OOPS Using Java Lab

REC_2028_OOPS using Java_Week 6_CY

Attempt : 1
Total Mark : 40
Marks Obtained : 36.5

Section 1 : Coding

1. Problem Statement

Adams has a reputation company with a great number of employees. He must calculate the salary weekly according to the hourly rate and working hours. Create a program to define a class Employee with attributes name and hourly rate. Create a subclass HourlyEmployee that calculates the weekly salary based on the number of hours worked.

(The first 40 hours are based on the regular hour rate. If the work hours are greater than 40 then the work wage is 1.5 times the hourly rate)

Note: Use Math(Math.max, Math.min) functions .

Example

Input:

Chris

10

45

Output:

Weekly Salary: Rs.475.00

Explanation:

Calculation:

The first 40 hours are paid normally: 40 × 10 = 400.00The extra 5 hours are paid at 1.5 times the hourly rate: 5 × (10×1.5) = 5 × 15 = 75.00Total salary: 400.00 + 75.00 = 475.00

Input Format

The first line of input consists of a string that represents the name of the employee.

The second line consists of a double value that represents the rate for an hour.

The last line consists of an integer that represents the total hours worked.

Output Format

The output displays the total salary of the employee, where salary is rounded to two decimal places in the format: "Weekly Salary: Rs.<double value>".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: Dave
10.0
40
Output: Weekly Salary: Rs.400.00

Answer

```
import java.util.Scanner;
```

```
import java.text.DecimalFormat;

// You are using Java
class Employee {
    protected String name;
    protected double hourlyRate;

    public Employee(String name, double hourlyRate) {
        this.name = name;
        this.hourlyRate = hourlyRate;
    }
}


class HourlyEmployee extends Employee {
    private int hoursWorked;

    public HourlyEmployee(String name, double hourlyRate, int hoursWorked) {
        super(name, hourlyRate);
        this.hoursWorked = hoursWorked;
    }

    public double calculateWeeklySalary() {
        int regularHours = Math.min(hoursWorked, 40);
        int overtimeHours = Math.max(hoursWorked - 40, 0);
        double regularPay = regularHours * hourlyRate;
        double overtimePay = overtimeHours * hourlyRate * 1.5;
        return regularPay + overtimePay;
    }
}
public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        String name = scanner.nextLine();
        double hourlyRate = scanner.nextDouble();
        int hoursWorked = scanner.nextInt();

        HourlyEmployee employee = new HourlyEmployee(name, hourlyRate,
hoursWorked);

        double weeklySalary = employee.calculateWeeklySalary();
```

```
        DecimalFormat df = new DecimalFormat("#.00");
        String formattedSalary = df.format(weeklySalary);
        System.out.println("Weekly Salary: Rs." + formattedSalary);
        scanner.close();
    }
}
```

Status : Correct ***Marks : 10/10***

2. Problem Statement

A bank provides two types of deposit schemes: Fixed Deposits (FD) and Recurring Deposits (RD). Customers want to calculate the interest they can earn based on their selected scheme.

Develop a Java program using inheritance to compute the interest for FD and RD. The program should include:

A base class Account with attributes accountHolder and principalAmount, along with a method for interest calculation.A subclass FixedDeposit that calculates interest for FD.A subclass RecurringDeposit that calculates interest for RD.

Formulas Used:

Interest for FD: (principal amount * duration in years * rate of interest) / 100

Interest for RD: (maturity amount * duration in months * rate of interest) / (12 * 100), where maturity amount = monthly deposit * duration in months.

Input Format

The first line of input consists of the choice (1 for FD, 2 for RD).

If the choice is 1, the following lines consist of account holder (string), principal amount (double), duration in years (int), and rate of interest (double).

If the choice is 2, the following lines consist of account holder (string), monthly deposit (int), duration in months (int), and rate of interest (double).

Output Format

The output prints the calculated interest with one decimal place in the following format.

For choice 1: "Interest for FD: <calculated interest >"

For choice 2: "Interest for FD: <calculated interest >"

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 1
Alice
50000.56
5
6.5
Output: Interest for FD: 16250.2

Answer

```
import java.util.Scanner;


class FixedDeposit {
    private String name;
    private double principal;
    private int duration;
    private double rate;

    public FixedDeposit(String name, double principal, int duration, double rate) {
        this.name = name;
        this.principal = principal;
        this.duration = duration;
        this.rate = rate;
    }

    public double calculateInterest() {
        return (principal * rate * duration) / 100.0;
    }
}
```

```
class RecurringDeposit {
    private String name;
    private double monthlyDeposit;
    private int duration;
    private double rate;

    public RecurringDeposit(String name, double monthlyDeposit, int duration,
double rate) {
        this.name = name;
        this.monthlyDeposit = monthlyDeposit;
        this.duration = duration;
        this.rate = rate;
    }

    public double calculateInterest() {
        return (monthlyDeposit * duration * rate) / 100.0;
    }
}


public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        int choice = sc.nextInt();

        switch (choice) {
            case 1:
                sc.nextLine();
                String fdName = sc.nextLine();
                double fdPrincipal = sc.nextDouble();
                int fdDuration = sc.nextInt();
                double fdRate = sc.nextDouble();

                FixedDeposit fd = new FixedDeposit(fdName, fdPrincipal, fdDuration,
fdRate);
                System.out.printf("Interest for FD: %.1f", fd.calculateInterest());
                break;

            case 2:
                sc.nextLine();
                String rdName = sc.nextLine();
```

```
            int rdDeposit = sc.nextInt();
            int rdDuration = sc.nextInt();
            double rdRate = sc.nextDouble();

            RecurringDeposit rd = new RecurringDeposit(rdName, rdDeposit,
rdDuration, rdRate);
            System.out.printf("Interest for RD: %.1f", rd.calculateInterest());
            break;

        default:
            System.out.println("Invalid Choice");
    }
  }
}
```

Status : Partially correct ***Marks : 6.5/10***

3. Problem Statement

Bob has been tasked with creating a program using CircleUtils class to calculate and display the circumference and area of the circle.

The program should allow Bob to input the radius of a circle as both an integer and a double and compute both the circumference and area of the circle using separate overloaded methods:

calculateCircumference- To calculate the circumference using the formula 2 * 3.14 * radiuscalculateArea- To calculate the area 3.14 * radius * radius

Write a program to help Bob.

Input Format

The first line of input consists of an integer m, representing the radius of the circle as a whole number.

The second line consists of a double value n, representing the radius of the circle as a decimal number.

Output Format

The first line of output displays two space-separated double values, rounded to

two decimal places, representing the circumference of the circle with the integer radius and the double radius, respectively.

The second line displays two space-separated double values, rounded to two decimal places, representing the area of the circle with the integer radius and the double radius, respectively.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 5
3.50
Output: 31.40 21.98
78.50 38.47

Answer

```
import java.util.Scanner;

// You are using Java
class CircleUtils {
    public double calculateCircumference(int radius) {
        return 2 * 3.14 * radius;
    }

    public double calculateCircumference(double radius) {
        return 2 * 3.14 * radius;
    }

    public double calculateArea(int radius) {
        return 3.14 * radius * radius;
    }


    public double calculateArea(double radius) {
        return 3.14 * radius * radius;
    }
}

class Main {
```

```
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        int radiusInt = scanner.nextInt();
        double radiusDouble = scanner.nextDouble();

        CircleUtils circleUtils = new CircleUtils();

        double circumferenceInt = circleUtils.calculateCircumference(radiusInt);
        double circumferenceDouble =
circleUtils.calculateCircumference(radiusDouble);
        double areaInt = circleUtils.calculateArea(radiusInt);
        double areaDouble = circleUtils.calculateArea(radiusDouble);

        System.out.format("%.2f %.2f\n", circumferenceInt, circumferenceDouble);
        System.out.format("%.2f %.2f", areaInt, areaDouble);

        scanner.close();
    }
}
```

Status : Correct **Marks : 10/10**

4. Problem Statement

Teena is launching a new airline, Boeing747, and needs to calculate the total revenue generated from ticket sales based on the ticket cost and seat availability. Teena's airline offers two types of seats: regular and premium. The ticket cost and seat availability for both types of seats need to be considered for revenue calculation.

To help with this, Teena wants to implement a system using multilevel inheritance with three classes:

Airline: This class will have the ticket cost as an attribute and defines the method setCost(double cost) and double getCost().Indigo: This class will extend Airline and add the seat availability attribute and defines the method getSeatAvailability() and setSeatAvailability(int seatAvailability) .Boeing747: This class will extend Indigo and include a method calculateTotalRevenue() based on the ticket cost and seat

availability .

Teena needs to calculate the total revenue using the formula:

Total Revenue = ticket cost * seat availability

Help Teena implement this system for calculating the revenue of her airline.

Input Format

The first line of input consists of a double value, representing the flight's ticket cost.

The second line consists of an integer, representing seat availability.

Output Format

The first line of output prints "Ticket Cost: Rs. " followed by a double value representing the ticket cost rounded to one decimal place.

The second line of output prints "Seat Availability: X seats" where X is an integer value representing the seat availability.

The third line of output prints "Total Revenue: Rs. " followed by a double value representing the total revenue rounded to one decimal place.

Refer to the sample output for the exact text and format.

Sample Test Case

Input: 1000.0
100

Output: Ticket Cost: Rs. 1000.0
Seat Availability: 100 seats
Total Revenue: Rs. 100000.0

Answer

```
import java.util.Scanner;

// You are using Java
class Airline {
    protected double cost;
```

```
    public void setCost(double cost) {
        this.cost = cost;
    }

    public double getCost() {
        return cost;
    }
}

class Indigo extends Airline {
    protected int seatAvailability;

    public void setSeatAvailability(int seatAvailability) {
        this.seatAvailability = seatAvailability;
    }

    public int getSeatAvailability() {
        return seatAvailability;
    }
}

class Boeing747 extends Indigo {
    public double calculateTotalRevenue() {
        return cost * seatAvailability;
    }
}
public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        Boeing747 plane = new Boeing747();

        double ticketCost = scanner.nextDouble();
        plane.setCost(ticketCost);
        int seatAvailability = scanner.nextInt();
        plane.setSeatAvailability(seatAvailability);

        System.out.printf("Ticket Cost: Rs. %.1f\n", plane.getCost());
        System.out.println("Seat Availability: " + plane.getSeatAvailability() + "
seats");
        System.out.printf("Total Revenue: Rs. %.1f\n",
plane.calculateTotalRevenue());
    }
```

}

Status : Correct *Marks : 10/10*